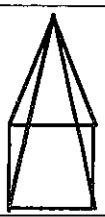
AMERICAN SCHOLASTIC MATHEMATICS ASSOCIATION

Please note that full solutions are given with each examination in the contest.

SAMPLE CONTESTS

JR/INTER SCHOOL DIVISION

	ANSWERS
1. The least common multiple of 2 positive integers is 144. The greatest common divisor is 2. Neither integer is 2. Find both integers.	
2. A store owner sold a vacuum cleaner for 40% off its marked price. The profit was 50% of its cost. What is the ratio of marked price to cost?	
3. Convert the base seven numeral 34 to base nine.	
4. For a regular pyramid with a square base, find the numerical value of the expression V + F - E, where V represents the number of vertices; F represents the number of faces; and E represents the number of edges. 	
5. A grandmother's age is 4 times the sum of the ages of her 4 grandchildren. Six years from now, her age will be one and one half times the sum of the ages of the 4 grandchildren. How old is the grandmother now?	
6. The symbol n!, where n is a positive integer, represents the product $n(n-1)(n-2)\ldots 3\ 2\ 1$. Find the numerical value of the sum: $\frac{10!}{9!}+\frac{9!}{8!}+\frac{8!}{7!}+\frac{7!}{6!}+\frac{6!}{5!}+\frac{5!}{4!}+\frac{4!}{3!}+\frac{3!}{2!}+\frac{2!}{1!}$	
7. From noon to 12 midnight, inclusive, of the same day, how many times does the hour hand and the minute hand of the clock meet?	

35 Minutes

October 11, 2007

AMERICAN SCHOLASTIC MATHEMATICS ASSOCIATION
JR/INTER SCHOOL DIVISION
CONTEST #1

NAME _____ SCHOOL _____

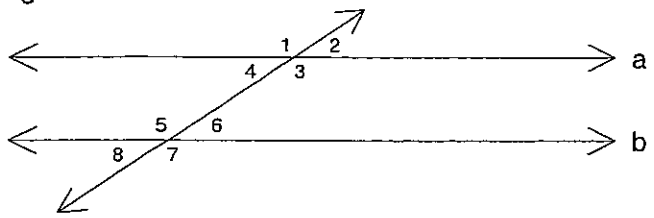
QUESTIONS	ANSWERS
1. Using only pennies (1 cent coin), nickels (5 cent coin), dimes (10 cent coin) and quarters (25 cent coin), how many different ways total 25 cents? (Not every type of coin needs to be present.)	1.
2. Farmer Murphy has cows, horses, pigs, ducks and chickens on his farm. The ratio of cows to chickens is 4 to 7. The ratio of pigs to ducks is 2 to 3. The ratio of cows to pigs is 8 to 5. The ratio of ducks to all animals is 5 to 27. If farmer Murphy has 48 cows, how many horses does he have?	2.
3. Find $10 + 40 \div 5 - 12 \times 3$	3.
4. The supplement of angle A and the complement of angle A are supplementary. Find the degree measure of angle A.	4.
5. If the length of the Loch Ness Monster is 20 meters and half her own length, how long is she?	5.
6. There are three cooking classes offered in the night school. Each class is limited to 25 students. The Chinese cooking class has 23 students, the Italian cooking class has 18 students and the French cooking class is full. What percent of the total possible number of students are enrolled?	6.
7. Two consecutive numbers have the property such that when the greater of the two is multiplied by 6, the answer is the same as subtracting 2 from the product of the smaller number and 7. What are the numbers?	7.

ADVISER: Transfer a "1" for each correct answer and a "0" for each incorrect answer to the return scorecard. Mail results within 5 days of the contest date. Please make up any missed contests and mail the results.

35 Minutes November 8, 2007

AMERICAN SCHOLASTIC MATHEMATICS ASSOCIATION
JR/INTER SCHOOL DIVISION
CONTEST #2

NAME _____ SCHOOL _____

QUESTIONS	ANSWERS
1. In 2007, Diedre is 16 and her mom is 40. In what year will her mom be twice as old as Diedre?	1.
2. Two fair 6-sided number cubes are rolled. What is the probability that the absolute value of the difference between the two numbers obtained is 1?	2.
3. The monthly finance charge on a charge account is 1% on the unpaid amount up to \$500, and $1\frac{1}{2}$ % on the unpaid amount over \$500. What is the finance charge on an unpaid balance of \$896?	3.
4. The average age of the 15 members of a chess club is 16 years. The day when 5 new members join the club, the average age becomes 15 years. Find the average age of just the 5 new members.	4.
5. Simplify this complex fraction and express the answer as a rational number in lowest terms: $\dfrac{1}{1 + \dfrac{1}{1 + \frac{4}{5}}}$	5.
6. Given a $\parallel$ b, $m\angle 4 = 8x + 4$ and $m\angle 8 = 5x + 25$. Find $m\angle 2$ in degrees. 	6.
7. Twin primes are pairs of prime numbers whose difference is exactly 2. 3 and 5 are twin primes. Find one pair of twin primes that falls between 150 and 190.	7.

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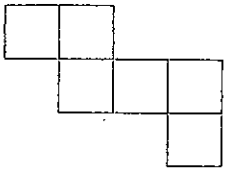
35 Minutes December 13, 2007

AMERICAN SCHOLASTIC MATHEMATICS ASSOCIATION
JR/INTER SCHOOL DIVISION
CONTEST #3

NAME _____ SCHOOL _____

QUESTIONS	ANSWERS
1. A Euclidean buys a stereo for 2330 Euclidean dollars. He pays with a bill worth 3000 Euclidean dollars and receives 340 Euclidean dollars in change. What positive number base do Euclideans use?	1.
2. This figure consists of six congruent squares and has an area of 726 cm^2. Find the perimeter of the figure. 	2.
3. One third less than two is how much less than one half less than three?	3.
4. Two more people are ahead of me in line than are behind me. There are three times as many people in line as there are people behind me. How many people are ahead of me in line?	4.
5. An item is discounted 25% for a sale, another 10% because of the size of the purchase, and 3% for paying in cash. These discounts are taken one after the other. The customer paid $209.52. What was the original purchase price?	5.
6. S is the set of 7 consecutive integers whose sum is 7. T is the set of 8 consecutive integers whose sum is (-12). How many integers appear in both set S and set T?	6.
7. Five cards, numbered 1, 2, 3, 4, 5 are shuffled and placed face down in a row. What is the probability that the 5 digit number that appears when the cards are placed face up is divisible by 6?	7.

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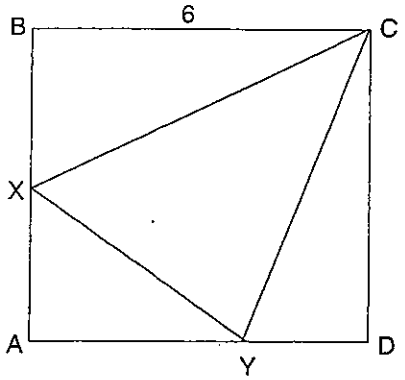
35 Minutes

January 10, 2008

AMERICAN SCHOLASTIC MATHEMATICS ASSOCIATION
JR/INTER SCHOOL DIVISION
CONTEST #4

NAME _____ SCHOOL _____

QUESTIONS	ANSWERS
1. One hundred dollars are deposited at the beginning of each year for five years in a bank which pays 6% interest compounded annually. What is the balance after five years?	1.
2. Find 6 consecutive positive integers that add to 87.	2.
3. An ape ate 100 bananas in 5 consecutive days. Each day he ate 6 more bananas than on the previous day. How many bananas did the ape eat on each of the five days?	3.
4. Al makes a wager with Bill. If Al wins, Bill will give Al $50. Al will then have three times as much money as Bill will have. If Bill wins, Al will give Bill $30. Bill will then have as much money as Al will have. How much money, in dollars, did Al have at the start?	4.
5. The first 3 terms of the Fibonacci sequence is 1,1,2. Thereafter, each term is the sum of the two preceding terms. Find the first term with zero in the units digit.	5.
6. Edith's age at her death was $\frac{1}{31}$ of the year of her birth, which occured during the 19th Century. In 1900, her second son was 10 years old. How old was she in 1900?	6.
7. In square ABCD, one side = 6, point x bisects AB and point Y is the trisection point of $\overline{AD}$ nearest D. Find the area of the triangle XYC.  (Not drawn to scale)	7.

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35 Minutes February 14, 2008

AMERICAN SCHOLASTIC MATHEMATICS ASSOCIATION
JR/INTER SCHOOL DIVISION
CONTEST #5

NAME _____ SCHOOL _____

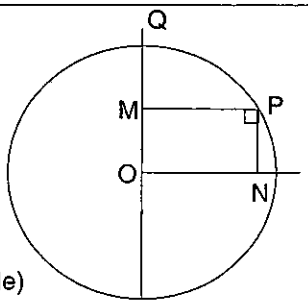
QUESTIONS	ANSWERS
1. Sue went shopping with $60. She spent one quarter of it on a skirt, $30 for shoes and 10% of the original amount on socks. How much money did Sue return home with?	1.
2. In pentagon ABCDE, angles A, B and C are congruent, and angles D and E are congruent. The m<A is 50° less than the m<D. Find the measure of each angle.	2.
3. Dave computed an answer to be 22.5. However, in the last step of the computation he multiplied by 0.3 instead of dividing by 0.3. Assuming that Dave computed correctly with the wrong number, what should have been the correct answer?	3.
4. A fair 8-sided die is numbered from 1 to 8, and a fair 12-sided die is numbered from 1 to 12. The dice are tossed. What is the probablity that the sum of the outcomes is 18?	4.
5. Find the base of the numerical system in which 34 - 17 = 18	5.
6. The average of x, y and z is 10. The average of x and y is 9. The average of x and z is 8. Find the average of y and z.	6.
7. A piggy bank contains a total of $3.80 in nickels (5 cent coins), dimes (10 cent coins) and quarters (25 cent coins). If there are 2 more dimes than nickels and 3 times as many quarters as nickels, how many of each kind of coin are in the bank?	7.

ADVISER: Transfer a "1" for each correct answer and a "0" for each incorrect answer to the return scorecard. Mail results within 5 days of the contest date. Please make up any missed contests and mail the results.

35 Minutes March 13, 2008

AMERICAN SCHOLASTIC MATHEMATICS ASSOCIATION
JR/INTER SCHOOL DIVISION
CONTEST #6

NAME _____ SCHOOL _____

QUESTIONS	ANSWERS
1. A person made purchases totaling \$195.25 using a credit card. The person paid \$50 per month on the unpaid balance and made no new purchases. What was the amount of the last payment if the interest rate is $1\frac{1}{2}\%$ per month?	1.
2. Find the sum of the reciprocals of all the factors of 24.	2.
3. Slim, Bobbi, Curly, Fred and Jo-Jo are in these positions at the finish of the race: Slim is 20 yards behind Bobbi. Jo-Jo is 30 yards ahead of Slim. Curly is 50 yards behind Jo-Jo. Fred is 10 yards behind Curly. Who is the winner?	3.
4. Find all pairs of unequal positive integers that have the property that the difference of their squares is 5 times the difference of the numbers themselves.	4.
5. The center of a circle is O. P is a point on the circle. $\overline{OQ} = 2\frac{1}{2}$ and in rectangle MPNO, $\overline{ON} = 2$ and $\overline{OM} = 1\frac{1}{2}$ What does $\overline{MN}$ equal?  (not drawn to scale)	5.
6. A "prime day" is a day such that both the month and the day are prime numbers. How many prime days occur in 2008?	6.
7. Positive integers are arranged in five columns as follows: 1 2 3 4 8 7 6 5 9 10 11 12 16 15 14 13 17 18 19 20 . . . . . In which column will 999 appear?	7.

ADVISER: Transfer a "1" for each correct answer and a "0" for each incorrect or missing answer to the return scorecard. Mail results within 5 days of the contest date. Please make up any missed contests and mail the results. **Note:** Since this is the last contest of the year, the adviser must make sure the cumulative score for each student is indicated on the scorecard so that we can issue the award for your highest-scoring student.

35 Minutes October 9, 2008

AMERICAN SCHOLASTIC MATHEMATICS ASSOCIATION
JR/INTER SCHOOL DIVISION
CONTEST #1

NAME _____ SCHOOL _____

QUESTIONS	ANSWERS
1. A multiple of 11 I be. Not odd, but even you see; My digits (a pair) When multiplied there, make a cube and a square out of me. What am I?	1.
2. Fannie Mae, an eccentric millionaire, visited Skip Junior High School. She gave seniors $10 each; however 40% of the seniors were not at Skip JHS that day. She gave all the juniors $6 each. The total enrollment of juniors and seniors is 2240. How much money did Fannie Mae give away?	2.
3. Manuel rode his bike 8 more miles than Karen in a bike-a-thon. If Karen rode 3 more miles, she would have traveled $\frac{2}{3}$ the distance that Manuel rode. How many miles did Karen ride?	3.
4. A storage bin is shaped like a rectangular prism with dimensions 2 feet by 3 feet by 4 feet. What is the effect on the surface area when the three dimensions of the storage bins are multiplied by 5?	4.
5. In a tennis tournament, 66 matches were played. If each member played every other member once, how many people played in the tournament?	5.
6. A car has an odometer reading 15951 miles, which is a palindrome (the number reads the same forward and backward). After two hours of driving at a constant speed, with a speed limit of 80, the number again is a palindrome. How fast, in miles per hour, was the car being driven during these two hours?	6.
7. Terry had scores of 82, 85, 87 and 92 on his mathematics tests. What is the lowest grade he can get on his next test and still have an average of at least 87.0?	7.

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35 Minutes November 13, 2008

AMERICAN SCHOLASTIC MATHEMATICS ASSOCIATION
JR/INTER SCHOOL DIVISION
CONTEST #2

NAME _____ SCHOOL _____

QUESTIONS	ANSWERS
1. Four days before tomorrow is Thursday. What is three days after yesterday?	1.
2. A number is abundant if the sum of its proper factors (all the factors of the number except itself) is greater than the number. Twelve is an abundant number because the sum of its factors (1 + 2 + 3 + 4 + 6) is 16>12. What is the next positive abundant number less than 50?	2.
3. Two fair number cubes have the first 6 odd prime numbers on their faces. (One number on each face.) What is the probability of obtaining a sum that is a multiple of 5 or 10 when the two cubes are tossed?	3.
4. A taxicab company charges \$0.65 for the first $\frac{1}{8}$ of a mile and \$0.15 for each additional $\frac{1}{8}$ of a mile. A woman takes a taxicab from her work to her home, a distance of 6 miles. How far is the woman from home when the taxicab meter reads \$3.50?	4.
5. If the price is the same, which is a better buy, a round pizza with a diameter of 10 inches or a square pizza, nine inches on each side?	5.
6. The sum of three numbers is 83. The first number is 13 larger than the second number and the third number is 9 less than the first. What is the smallest of the three numbers?	6.
7. Tuffy's collection contains 400 novels. The number of mystery novels is 65% of the number of science fiction novels; the number of romance novels is 46% of the number of mystery novels; and the number of horror novels is 17% of the number of romance novels. (Percentages are rounded.) How many mystery novels does Tuffy have?	7.

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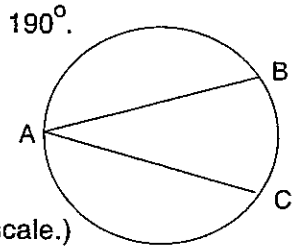
35 Minutes

December 11, 2008

AMERICAN SCHOLASTIC MATHEMATICS ASSOCIATION
JR/INTER SCHOOL DIVISION
CONTEST #3

NAME _____ SCHOOL _____

QUESTIONS	ANSWERS
1. When gold is made into jewelry, a scale of 0 to 24 karats is used. 24 karat gold is 100% pure. What % pure is 14 karat gold?	1.
2. Divide 100 into 4 unequal numbers so that if 4 is subtracted from the first number, 4 is added to the second number, the third number is multiplied by 4 and the fourth number is divided by 4, an identical result is obtained in each instance. What are the numbers?	2.
3. A restaurant manager needed many pounds of potatoes. The first supplier she called charged \$0.22 a pound but the manager calculated she would be \$16.80 over her budget for the number of pounds she needed. Another supplier charged \$0.16 a pound. The manager calculated she would be \$9.60 under her budget after placing this order. How many pounds of potatoes did the manager need?	3.
4. In the following circle, $m\overset{\frown}{ABC} = 230^\circ$ and $m\overset{\frown}{ACB} = 190^\circ$. Find m<CAB in degrees.  (Not drawn to scale.)	4.
5. In how many ways can five children line up on a sled, one behind the other, if one child is afraid and will not go first?	5.
6. Write the next two numbers in the sequence: 2,6,30,210,2310, _____ , _____ (Hint: make factor trees.)	6.
7. The arithmetic mean of 5 numbers is 2. If the smallest of the 5 numbers is taken away, the average of the remaining numbers is 4. What is the smallest number in the original set?	7.

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35 Minutes January 8, 2009

AMERICAN SCHOLASTIC MATHEMATICS ASSOCIATION
JR/INTER SCHOOL DIVISION
CONTEST #4

NAME _____ SCHOOL _____

QUESTIONS	ANSWERS
1. Twenty-five postage stamps, some costing \$0.18 and some costing \$0.22, cost a total of \$4.90. How many stamps are \$0.18 stamps?	1.
2. The width of a room is two-thirds of the length. If 5 feet were added to the width and 5 feet were subtracted from the length, the room would be a square. What is the length of the room?	2.
3. The numerator and denominator of a fraction are in the ratio 3:4. If 1 is subtracted from the numerator and 2 is added to the denominator, the value of the resulting fraction is equal to $\frac{2}{3}$. Find the original fraction.	3.
4. A certain deck of cards contains forty-eight cards. There are two each of the 9 through ace in the four suits. If two cards are drawn at random, without replacement, what is the probability that both cards will be black or both will be kings?	4.
5. A baseball team wins forty of its fifty games and has forty remaining games to play. How many of the remaining games must the team win in order to win 70% of its entire game schedule?	5.
6. How many whole numbers are between $\sqrt{7}$ and $\sqrt{77}$?	6.
7. One class of 30 students averaged 52 on an exam. Another class of 25 students averaged 30 on the same test. What was the average of all 55 students?	7.

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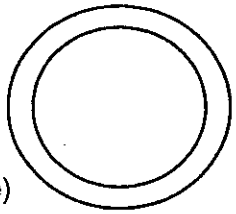
35 Minutes

February 12, 2009

AMERICAN SCHOLASTIC MATHEMATICS ASSOCIATION
JR/INTER SCHOOL DIVISION
CONTEST #5

NAME _____ SCHOOL _____

QUESTIONS	ANSWERS
1. Tom's age is a prime number. Two years ago his age was also a prime number. Six years ago, his age was an odd square. We know that Tom can vote, (he is over 18) but he cannot apply for Medicare yet (he's not over 65). How old is Tom?	1.
2. Find the largest two-digit number that is equal to 4 times the sum of its digits.	2.
3. Three fair-numbered cubes whose faces are numbered 1 through 6 are tossed. In how many ways can the sum of 15 be obtained? (Hint: a toss of 6,6,3 is different from a toss of 6,3,6)	3.
4. The following circles are concentric (they have the same center). The inner circle has a radius of 4 cm and the area of the region between circles is 20π cm^2 . What is the diameter of the larger circle? (not drawn to scale) 	4.
5. This and that and a fourth of this and that is what percentage of this and that?	5.
6. The corner gasoline station was able to store $68\frac{1}{2}$ gallons of unleaded gasoline which had cost \$0.72 per gallon. There was a leak in the tank and $\frac{3}{8}$ of the gasoline was lost. After fixing the tank, the remainder was sold at \$.90 per gallon. How much did they profit or lose, rounded to the nearest penny (one cent)? (Answer must include amount and statement of loss or gain)	6.
7. Ten triangles weigh as much as 3 squares and 1 circle. Two triangles and 1 circle are equal in weight to 1 square. How many triangles weigh as much as 1 square?	7.

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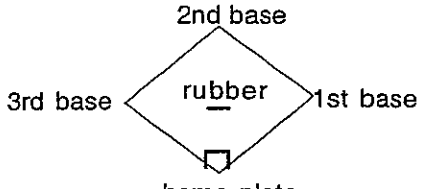
35 Minutes March 12, 2009

AMERICAN SCHOLASTIC MATHEMATICS ASSOCIATION
JR/INTER SCHOOL DIVISION
CONTEST #6

NAME _____ SCHOOL _____

QUESTIONS	ANSWERS
1. Twenty-four people are gathered for a conference. Everyone shakes hands with everyone else. If the conference begins at 9:00 AM, each handshake takes 30 seconds and twelve pairs of people are shaking hands simultaneously during each 30-second period, at what time is the handshaking completed?	1.
2. Alice has 63 cents in dimes (10-cent coins), nickels (5-cent coins) and pennies (1-cent coins). If she has 12 coins, how many nickels does she have?	2.
3. When the length of each side of a square is increased by 5 units, the area of the square is $2\frac{1}{4}$ times the area of the original square. What is the area of the original square?	3.
4. What is the difference between the largest and the smallest prime factors of 16095?	4.
5. When one ounce of water is added to a mixture of alcohol and water, the new mixture is 20% alcohol. When one ounce of alcohol is added to the new mixture, the result is $33\frac{1}{3}$% alcohol. What was the percent alcohol in the original mixture?	5.
6. Five test scores were lost, but a summary of the five test scores indicates that the mode was 90, the median was 85 and the mean 83. If the grades were integers and could range from 0 to 100, what is the lowest possible grade from the missing set of scores?	6.
7. A baseball diamond is a square with a perimeter of 360 feet. The distance from the front edge of the pitcher's rubber to the rear point of home plate is $\frac{1}{2}$ foot more than $\frac{2}{3}$ of the distance between consecutive bases. How many feet is the front of the pitcher's rubber to the rear point of home plate?  (not drawn to scale)	7.

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35 Minutes October 8, 2009

AMERICAN SCHOLASTIC MATHEMATICS ASSOCIATION

JR/INTER SCHOOL DIVISION

CONTEST #1

NAME _____ SCHOOL _____

QUESTIONS	ANSWERS
1. The letters in this expression represent the same numbers they represent on a telephone dial. Find the numerical answer. $\frac{P-R+Y}{M+A+D \div H^2} = ?$	1.
2. Point C is the midpoint of $\overline{AB}$, point D is the midpoint of $\overline{AC}$, point E is the midpoint of $\overline{AD}$ and point F is the midpoint of $\overline{AE}$. If AF = 3, what is the number of units in the length of $\overline{AB}$?	2.
3. A man bought some plates: $\frac{2}{3}$ of them were cracked; $\frac{1}{2}$ of them were chipped; and $\frac{1}{4}$ were both cracked and chipped. All but two of the plates were either chipped or cracked or both. How many plates did he buy?	3.
4. You just started your drive to Lake Ponderosa, a distance of 300 miles. You must check into the campground in $6\frac{1}{2}$ hours. If you average 44 miles per hour for the first 198 miles, what should be your average speed for the rest of the journey?	4.
5. In how many different ways can a panel of four on-off switches be set if no two adjacent switches may be off?	5.
6. The product of two consecutive odd positive integers added to their sum is 119. What are these two integers?	6.
7. A game cartridge was on sale last week at 15% off the regular price. Then an additional 10% of the sale price was deducted to give a super sale price of $25.09. What was the regular price of the cartridge?	7.

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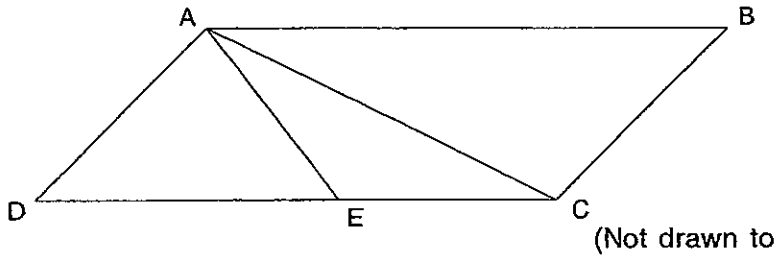
35 Minutes November 12, 2009

AMERICAN SCHOLASTIC MATHEMATICS ASSOCIATION

JR/INTER SCHOOL DIVISION

CONTEST #2

NAME _____ SCHOOL _____

QUESTIONS	ANSWERS
1. The digit 3 is written at the right of a certain two-digit number, thus forming a three-digit number. The new number is 372 more than the original two-digit number. What was the original two-digit number?	1.
2. Misters Blue, Gray and White have shirts and ties that are blue, gray and white. No man's clothing is the same color as his name. No man wears the same colored tie or shirt as any other man. If Mr. Blue's tie the same color as Mr. Gray's shirt, what is the color of Mr. White's shirt?	2.
3. Fifty percent more than what number is 25 percent less than 60 percent more than 10?	3.
4. Alpha, Beta and Cookie are horses of equal ability with each as likely to win as another. When the three horses race, what is the probability that they will finish in alphabetical order? (Assume no ties are allowed.)	4.
5. A certain number has exactly eight factors, of which 35 and 77 are two. Find the value of the number.	5.
6. What is a particular number if $\frac{1}{2}$ of it plus $\frac{2}{3}$ of it is 42?	6.
7. In the parallelogram ABCD, $\overline{DE} = \overline{EC}$, $\overline{AC}$ is a diagonal and a line segment ($\overline{AE}$) connects points A and E. What is the ratio of the area of Δ ADE to the area of the parallelogram?  (Not drawn to scale)	7.

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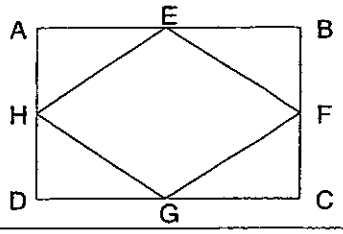
35 Minutes December 10, 2009

AMERICAN SCHOLASTIC MATHEMATICS ASSOCIATION
JR/INTER SCHOOL DIVISION
CONTEST #3

NAME _____ SCHOOL _____

QUESTION	ANSWER
1. If the digits used in writing the numerals 1, 2, 3, . . ., 100 are listed, what are their mean, median, and mode? (All three answers are required)	1.
2. Three tired and hungry men had a bag of apples. When they were asleep, one of them awoke, ate $\frac{1}{3}$ of the apples, and went back to sleep. Later, a second man awoke, ate $\frac{1}{3}$ of the remaining apples, and went back to sleep. Finally, the third man awoke and ate $\frac{1}{3}$ of the remaining apples, leaving 8 apples in the bag. How many apples were in the bag originally?	2.
3. Given rectangle ABCD with length twice the width; midpoints E, F, G, H; perimeter of ABCD is 48 units. Find the area of EFGH.  (Not drawn to scale.)	3.
4. Subject Survey - Home Room 114: 18 like Math, 32 like English, 25 like Language. 8 like Math and English, 16 like English and Language, 7 like Math and Language, 3 like all subjects. Everyone likes at least one of the three subjects. How many students are in H.R. 114?	4.
5. A grocer bought 12 dozen oranges at 24 cents a dozen. He found 18 bad oranges in the box and he sold the rest at the rate of 3 oranges for 8 cents. Find his percentage of gain or loss.	5.
6. Tom and his two brothers bought identical notebooks when school started in September, and each of them bought three. Tom, the eldest, paid for the entire purchase with a $10 bill. He received under half a dollar in change, all in nickels. There was no sales tax and the price cannot be fractional. What was the price of one notebook?	6.
7. Fred's Fast Food Menu reads: Fredburger, milk shake, order of fries . . . . . $3.72 The cost of 1 Fredburger = the cost of 1 milk shake and 2 orders of fries. The cost of 3 milk shakes = the cost of 1 Fredburger and 1 order of fries What is the cost of a Fredburger, a milkshake, and two orders of fries?	7.

ADVISER: Transfer a "1" for each correct answer and a "0" for each incorrect answer to the return scorecard. Mail results within 5 days of the contest date. Please make up any missed contest and mail the results.

ASMA

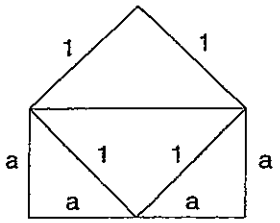
35 Minutes January 14, 2010

AMERICAN SCHOLASTIC MATHEMATICS ASSOCIATION

JR/INTER SCHOOL DIVISION

CONTEST #4

NAME _____ SCHOOL _____

QUESTION	ANSWER
1. A wagon train had ninety-six wagons, each carrying the same number of people. When twelve wagons broke down, each of the other wagons had to carry one more person. How many people were in each wagon originally?	1.
2. If $A * B = AB + 1$ and $A \# B = \frac{(A + B)}{2}$, then find $3 * [(7 \# 3) \# (3 * 4)]$	2.
3. A farm stand sells cider from two barrels. The smaller barrel holds 336 L, but it is now only $\frac{5}{6}$ full. The farmer empties this cider into the other barrel and finds that the cider fills only $\frac{4}{9}$ of it. How much cider would the larger barrel hold when full?	3.
4. The home plate used in baseball can be produced by filling in two corners of a 1-by-1 square as shown. What is the area of home plate?  (Not drawn to scale.)	4.
5. Sarah is paid a graduated commission. She receives 5% of the first \$1,500 in sales, 7% of the next \$1,500 in sales and 10% of all sales over \$3,000. Find her commission if her sales totaled \$15,800.	5.
6. Two balls of solid color and one striped ball are on the pool table, as well as the cue ball (white) and the eight ball (black). Your little sister races in and takes a ball from the table and leaves with it. Your little brother also takes a ball. What is the probability that the ball your brother took is striped?	6.
7. Larry has been saving his money to buy new hubcaps for his car. He counted his money and found that he had more than enough money to make his purchases. He had several nickels (five-cent coin), 89 dimes (ten-cent coin), 112 quarters (twenty-five-cent coin), 7 half-dollars (fifty-cent coin), 67 one-dollar bills, and 7 five-dollar bills. If the hubcaps cost \$144, what is the least number of nickels he can have?	7.

ADVISER: Transfer a "1" for each correct answer and a "0" for each incorrect answer to the return scorecard. Mail results within 5 days of the contest date. Please make up any missed contest and mail the results.

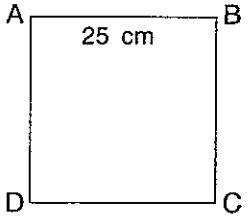
35 Minutes February 11, 2010

AMERICAN SCHOLASTIC MATHEMATICS ASSOCIATION

JR/INTER SCHOOL DIVISION

CONTEST #5

NAME _____ SCHOOL _____

QUESTION	ANSWER
1. A grandfather clock chimes 4 times fifteen minutes after the hour; 8 times on the half-hour, 12 times forty-five minutes after the hour; and on the hour it strikes 16 times plus one strike for each hour. In one week, how many chimes are struck by that clock?	1.
2. What are the dimensions of square EFGH you must cut from square ABCD, whose side is 25 cm, so that the remaining area is reduced by 25 percent?  (Not drawn to scale.)	2.
3. A particular bike wheel makes 1056 revolutions in one mile. What is the approximate radius of the wheel in feet?	3.
4. Express as a common fraction: $\left[\left(\frac{1}{2}\right)^{-1} + \left(\frac{1}{3}\right)^{-1} + \left(\frac{1}{5}\right)^{-1} + \left(\frac{1}{7}\right)^{-1} \right]^{-1}$	4.
5. What is the difference between the two largest prime factors of 14190?	5.
6. The ratio of females to males in a school band is 7 to 4. If three females and twelve males are absent from practice, the ratio of females to males is 5 to 2. How many members of the band attend practice?	6.
7. Ed, Dana and Monica own the Main Street Delicatessen. Ed put up $18,750; Dana put up $15,000; and Monica put up $12,500. Each person receives a share of the profit according to the amount invested. Last year, the Deli made a profit of $18,500. What was Monica's share of the profit in dollars?	7.

ADVISER: Transfer a "1" for each correct answer and a "0" for each incorrect answer to the return scorecard. Mail results within 5 days of the contest date. Please make up any missed contest and mail the results.

ASMA

35 Minutes

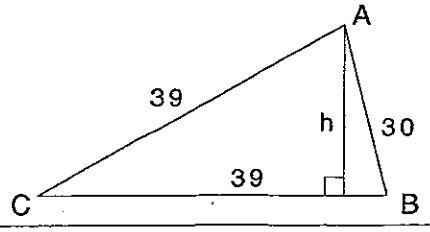
March 11, 2010

AMERICAN SCHOLASTIC MATHEMATICS ASSOCIATION

JR/INTER SCHOOL DIVISION

CONTEST #6

NAME _____ SCHOOL _____

QUESTION	ANSWER
1. Calculate the altitude "h" of the isosceles triangle shown.  (Not drawn to scale.)	1.
2. On Monday, a store put out 10 watermelons to be sold and some were sold. On Tuesday, the number left over was doubled, and again the same number was sold as on Monday. On Wednesday, the number left over was tripled, and the same number sold as on Monday, leaving none left over. How many were sold each day?	2.
3. The price of a particular dress is such that the profit is 20 percent of the price. Increasing the price by $20 results in a profit of one-third of the price. What was the original price of the dress?	3.
4. Dr. Thomas McKay lived $\frac{3}{13}$ of his life as a child. He spent $\frac{4}{39}$ of his life preparing for his outstanding career in medicine. For $\frac{1}{2}$ of his life, he was a very successful surgeon in a famous children's hospital. Since his retirement, he has lived 13 years on a comfortable pension. How old is he now?	4.
5. The face of a 12-hour digital clock can be considered to be constructed of twenty-three different lights and a colon. What time is it when the fewest number of lights are lit? What time is it when the largest number of lights are lit? (Both answers required.)	5.
6. Karen, Beth and Jarrett each tried to guess the weight of a giant pizza. Karen's guess: 59 pounds Beth's guess: 94 pounds Jarrett's guess: 121 pounds One guess was off by 16, one guess was off by 19, and one guess was off by 43. How many pounds did the pizza weigh?	6.
7. Every graduating senior from Washington High School enters Augusta College, as do $\frac{1}{2}$ of those from Lincoln High School. At Augusta College, $\frac{1}{2}$ the freshmen are from Washington HS. Of 960 graduates from Lincoln HS and 640 graduates from Washington HS, how many of Augusta College's freshmen class are graduates from neither Washington nor Lincoln?	7.

ADVISER: Transfer a "1" for each correct answer and a "0" for each incorrect answer to the return scorecard. Mail results within 5 days of the contest date. Please make up any missed contest and mail the results.

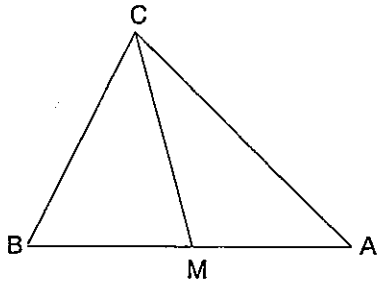
Note: Since this is the last contest of the year, the adviser must make sure the cumulative score for each student is indicated on the scorecard so that we can issue the award for your highest-scoring student.

35 Minutes

October 14, 2010

AMERICAN SCHOLASTIC MATHEMATICS ASSOCIATION
JR/INTER SCHOOL DIVISION
CONTEST #1

NAME _____ SCHOOL _____

QUESTIONS	ANSWERS
1. 150% of a number is 300. What is the number?	1.
2. The average (arithmetic mean) age of a group of six people is 23 years. In four years, what will their average age be?	2.
3. A store is open 67 hours each week. Each weekday it is open for 2 hours less than on Saturday. On Sunday it is open for half as long as on weekdays. How many hours is the store open on Monday?	3.
4. Jane of "Jane's Stationery Store" purchases pens from the "All Write Pen Company" at $3.79 a dozen and sells the pens for 2 for $1.00. How many dozen pens would Jane have to buy from the "All Write Pen Company" and then sell in order to make a profit of at least $100? (Answer in whole dozens)	4.
5. In the diagram, M is the midpoint of line segment AB. If the area of triangle ACM is 5 square centimeters, how many square centimeters is the area of triangle ABC?  (not drawn to scale)	5.
6. For which pair of numbers does their sum equal their product? $1\frac{3}{5}$ $2\frac{2}{5}$ $2\frac{3}{5}$ $2\frac{2}{3}$ (Both numbers required)	6.
7. At a party, 4 couples meet and shake hands. Each person shakes hands with everyone except his or her own spouse. How many handshakes are there?	7.

ADVISER: Transfer a "1" for each correct answer and a "0" for each incorrect answer to the return scorecard. Mail results within 5 days of the contest date. Please make up any missed contests and mail the results.

35 Minutes November 11, 2010

AMERICAN SCHOLASTIC MATHEMATICS ASSOCIATION
JR/INTER SCHOOL DIVISION
CONTEST #2

NAME _____ SCHOOL _____

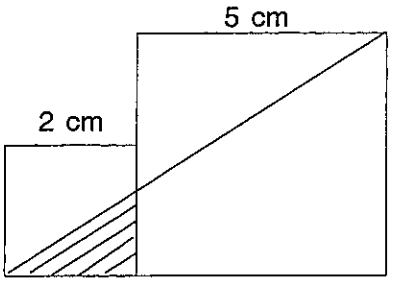
QUESTION	ANSWER
1. On how many pages in a 500-page book, with all pages numbered, will the number 3 appear at least once?	1.
2. What fraction of an hour passed between 2:55 PM today and 3:19 PM today? (Disregard seconds.) What fraction of the day was that? (Two answers required)	2.
3. In square ABCD, AB = 4 cm. At each corner of the square, a toothpick of length 4 cm is attached. The four loose ends of the toothpicks are attached together at a new point P, which is outside the plane of the square. The toothpicks together with the square now form a pyramid with a square base. Find the number of degrees in angle APB.	3.
4. In a certain game, one heart + one spade = 12 points. one heart + one club = 11 points one spade + one club = 10 points How many points would 2 hearts equal?	4.
5. Cheapo's Department Store is having a sale. It is selling widgits at 20% off list price. However, it charges its customers a fee of 10% of the sale price as a service charge (for the overhead of running the sale). What is the actual discount in percent that someone buying widgits will get?	5.
6. At the mall, Jeff spent half his money on a record. He then spent $2.75 on a magazine. He loaned three-fourths of the money he had left to his sister and spent his last $1.35 on a sandwich. How much money did Jeff start out with?	6.
7. For the set {30, 80, 50, 40, x} the mean, median and mode are all equal. Find x.	7.

ADVISER: Transfer a "1" for each correct answer and a "0" for each incorrect answer to the return scorecard. Mail results within 5 days of the contest date. Please make up any missed contests and mail the results.

35 Minutes December 9, 2010

AMERICAN SCHOLASTIC MATHEMATICS ASSOCIATION
JR/INTER SCHOOL DIVISION
CONTEST #3

NAME _____ SCHOOL _____

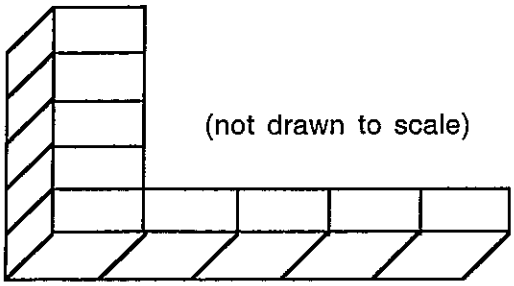
QUESTION	ANSWER
1. I have only dimes (ten-cent coins), nickels (five-cent coins) and pennies (one-cent coins) in my pocket. Seven of the coins are dimes, 25 percent of the coins are nickels and $\frac{5}{9}$ of them are pennies . How much money do I have?	1.
2. How many numbers that are perfect squares can be displayed on a digital clock in a 12-hour period? (The colon [:] separating hours and minutes is ignored.)	2.
3. Huey, Dewey and Louie each have sweatshirts with their own names written on them. None of the guys is wearing the shirt with his own name on it. If Huey is wearing Dewey's shirt, then who is wearing Louie's shirt?	3.
4. The two squares have dimensions as indicated. What is the area of the shaded triangle? (not drawn to scale) 	4.
5. After 38 liters of gasoline were put in an empty tank, the tank was still 5% empty. How many liters does the tank hold when full?	5.
6. There is a stack of 5 identical cement blocks in a storeroom. The bottom of the top block is $4\frac{1}{2}$ feet from the ceiling. The bottom of the next highest block is $6\frac{1}{4}$ feet from the ceiling. How high is the ceiling of the storeroom?	6.
7. The Santiago family went on an automobile trip. They travelled a total of 15 hours to reach their destination. On the trip home, their average (mean) speed was 6 miles per hour (mph) faster than the trip going. They made the trip home in $1\frac{1}{2}$ hours less time. What was the average speed for each part of the trip? (use d = rt)	7.

ADVISER: Transfer a "1" for each correct answer and a "0" for each incorrect answer to the return scorecard. Mail results within 5 days of the contest date. Please make up any missed contests and mail the results.

35 Minutes January 13, 2011

AMERICAN SCHOLASTIC MATHEMATICS ASSOCIATION
JR/INTER SCHOOL DIVISION
CONTEST #4

NAME _____ SCHOOL _____

QUESTION	ANSWER
1. It takes 5 hours to fill a swimming pool with water using a hose. The full pool can be drained in 6 hours. If the hose is on and the drain is open, how long, in hours, will it take to fill the pool?	1.
2. To form the L, 9 white cubes were glued together. The L was then dipped into red paint so that all of its sides were completely covered. If the cubes in the L were separated, how many cubes would have exactly 4 red surfaces?  (not drawn to scale)	2.
3. What percent of the number 25 is the number $\frac{1}{2}$?	3.
4. Rearrange the numbers on a clock face (analog) so that all the sums of pairs of adjacent numbers will be composite numbers between 7 and 17.	4.
5. Mrs. Guggenheim took the arithmetic mean (average) of the fifty test grades of her students on a test and found it to be 38. She then found that 2 of her students were ill on the day of the test and decided not to count their two scores of 45 and 55. What is the mean of the remaining scores (to the nearest tenth)?	5.
6. Paul has a stack of colored cards. Each color is associated with a number as follows: yellow: 2 red: 3 blue: 5 purple: 7 Sue selects some cards whose product is 70,560. How many of each color does she have?	6.
7. A rectangular piece of land is worth $1000. The length and width of a second rectangular piece of land are 50% greater than those of the first piece. How much is the second piece of land worth?	7.

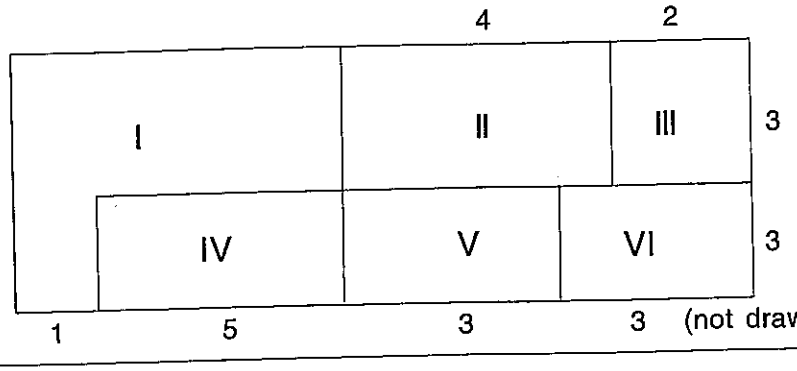
ADVISER: Transfer a "1" for each correct answer and a "0" for each incorrect answer to the return scorecard. Mail results within 5 days of the contest date. Please make up any missed contest and mail the results.

35 Minutes

February 10, 2011

AMERICAN SCHOLASTIC MATHEMATICS ASSOCIATION
JR/INTER SCHOOL DIVISION
CONTEST #5

NAME _____ SCHOOL _____

QUESTION	ANSWER
1. Four cards are lined up next to each other in a row in no order. Each has a number on the other side. The numbers are 67, 23, 84 and 51. Use these clues to find which number goes on which card. Clues: • A prime number is between 2 composite numbers • The odd multiple of 3 has no number on its left. • The least number is not between two cards.	1.
2. A palindrome is a number that reads the same forward and backward. For example, 121 and 45654 are palindromes. On a digital clock, if the symbol (:) is ignored, 1:21 and 12:21 are palindromes. On a digital clock, what is the shortest time between two consecutive palindromes? List the time in minutes and the palindromes. (two answers are required)	2.
3. For babysitting, Tina charges \$1.50 per hour until midnight and \$2.25 per hour after midnight. On Friday, Tina earned \$13.00 for babysitting until 2:00 AM. At what time did she begin to babysit?	3.
4. Which region of the following rectangle shows $16\frac{2}{3}$ % of the total area?  (not drawn to scale)	4.
5. The base of an isosceles triangle measures 10 inches, and the area of the triangle is 60 square inches. What is the length in inches of the two congruent sides?	5.
6. Marco has painted an entire log except the bases to use in Mrs. Smith's class play. He painted $\frac{1}{2}$ green, $\frac{2}{3}$ of the remaining log red, $\frac{1}{8}$ of the half that is not green in yellow and 5 inches blue. How long is the log?	6.
7. Find a four-digit number so that when a decimal point is placed between its hundreds and tens digit, the result is the average of the two-digit numbers on either side of the decimal point.	7.

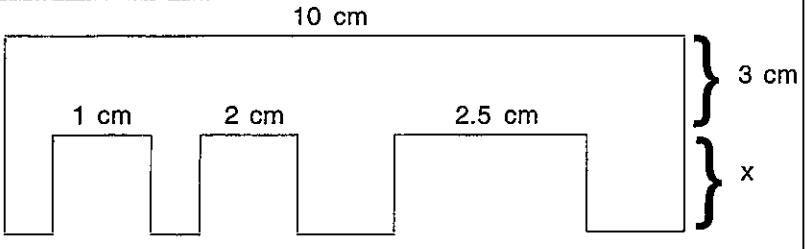
ADVISER: Transfer a "1" for each correct answer and a "0" for each incorrect answer to the return scorecard. Mail results within 5 days of the contest date. Please make up any missed contests and mail the results.

35 Minutes

March 10, 2011

AMERICAN SCHOLASTIC MATHEMATICS ASSOCIATION
JR/INTER SCHOOL DIVISION
CONTEST #6

NAME _____ SCHOOL _____

QUESTION	ANSWER
1. A circle graph showing the colors of cars produced by a manufacturer has five sectors. The manufacturer produced twice as many black cars as red cars and twice as many red cars as grey cars. Blue cars and white cars each accounted for 15% of the manufacturer's production. What is the central angle for the red car sector?	1.
2. Bob took three positive integers. He subtracted the second from the first. Then he subtracted the third from this difference. Gina took the same three numbers in the same order, but subtracted the third from the second and then subtracted this difference from the first number. Gina's final result was 12 larger than Bob's. What was the third number they both used?	2.
3. A car travels 40 mph for 20 miles, 36 mph for 24 miles and 48 mph for 16 miles. What is the average (mean) speed in miles per hour? (use d = rt)	3.
4. One football and one golf ball weigh as much as one baseball and one tennis ball. Three golf balls weigh as much as one tennis ball and one baseball. One baseball weighs as much as eight tennis balls. How many tennis balls weigh as much as one football?	4.
5. Alex, Bill and Carl each have a certain amount of money. Alex gave Bill as much money as Bill first had. Then Bill gave Carl as much money as Carl first had. Then Carl gave Alex as much money as Alex then had. They each ended up with 16 cents (sixteen one-cent coins). How many cents did Alex start with?	5.
6. This figure has a perimeter of 58 cm. What is the measure of x? (not drawn to scale) 	6.
7. If you begin with the fraction $\frac{1}{3}$ and add the denominator to the numerator and denominator, the fraction is doubled: $\frac{1}{3} \rightarrow \frac{1+3}{3+3} = \frac{4}{6} = \frac{2}{3}$ Find a fraction that will triple when its denominator is added to its numerator and denominator. (Express answer in lowest terms.)	7.

Note: Since this is the last contest of the year, the adviser must make sure the cumulative score for each student is indicated on the scorecard so that we can issue the award for your highest scoring student.